

# CHEMICAL WEED AND BRUSH CONTROL



## SUGGESTIONS FOR RANGELAND

# 2008 UPDATE

*This publication provides an update for some of the herbicide recommendations contained in B-1466. The herbicide control recommendations contained in this update for a specific weed or brush species supercedes any information contained in the original publication.*



## Common, Chemical and Product Names of Herbicides\*

Herbicide common name	Chemical name	Product name	Active ingredient or acid equivalent
Aminopyralid	2-pyridine carboxylic acid, 4-amino-3, 6-dichloro-2-pyridine carboxylic acid, triisopropanolammonium salt	Milestone	2 lbs./gal.
Aminopyralid 1:8, 2, 4-D	See aminopyralid and 2, 4-D	GrazonNext	3 lbs./gal.
Clopyralid	3,6-dichloro-2-pyridinecarboxylic acid	Reclaim, Pyramid R&P, Clopyralid 3	3 lbs./gal.
2,4-D	(2,4-dichlorophenoxy) acetic acid	Weedar 64, Formula 40, Hi-Dep, Weedone LV4, Esteron 99 and others	amine salts and esters of variable concentration
Dicamba	3,6-dichloro-2-methoxybenzoic acid	Banvel, Clarity, Vision	4 lbs./gal.
Dicamba:2,4-D(1:3)	See dicamba and 2,4-D	Weedmaster, Banvel + 2,4-D, RangeStar, Outlaw	4 lbs./gal.
Diesel fuel oil or kerosene	refined petroleum fractions	Several manufacturers	
Fluroxypyr	1-methylheptyl ester: ((4-amino-3,5-dichloro-6-fluoropyridin-2-yl)oxy)acetic acid	Vista	1.5 lbs./gal.
Glyphosate	N-(phosphonomethyl) glycine	Several including Rodeo**, Roundup, Roundup Ultradry, Glyosate 417	isopropylamine salt*, concentration varies depending on the product
Hexazinone	3-cyclohexyl-6-(dimethylamino)-1-methyl-1,3,5-triazine-2,4(IH, 3H)-dione	Velpar L, Pronone Power Pellet	2 lbs./gal. (Velpar L) 75% (Pronone Power Pellet)
Imazapyr	2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-3-pyridinecarboxylic acid	Arsenal, Habitat**	2 lbs./gal.
Metsulfuron methyl	methyl 2[[[(4-methoxy-6-methyl-1,3,5-triazin-2-yl)amino]carbonyl]amino] sulfonyl] benzoate	Escort, Clean Pasture, MSM 60DF	60%
Metsulfuron:Chlorosulfuron 3:1	See Metsulfuron methyl + 2-Chloro-N-[(4-methoxy-6-methyl-1,3,5-triazin-2-yl)aminocarbonyl] benzenesulfonamide	Cimarron Plus	48% metsulfuron 15% Chlorosulfuron
Metsulfuron:Chlorosulfuron 1:1	See metsulfuron: Chlorosulfuron	Cimarron X-Tra	30% Metsulfuron 37.5% Chlorosulfuron
Metsulfuron methyl Dicamba:2,4-D(1:3)	See metsulfuron methyl, dicamba and 2,4-D	Cimarron Max	60% (Part A) 3.87 lbs./gal. (Part B)
Picloram	4-amino-3,5,6-trichloro-2-pyridinecarboxylic acid	Tordon 22K, Triumph 22K, Picloram 22K	2 lbs./gal.
Picloram:Fluroxypyr (1:1)	See picloram and Fluroxypyr	Surmount	1.34 lbs./gal.
Picloram:2,4-D(1:4)	See Picloram and 2,4-D	Grazon P+D, Gunslinger, Picloram + D	2.5 lbs./gal.
Tebuthiuron	N-[5-(1,1-dimethylethyl)-1,3,4-thiadiazol-2-yl]-N-N'-dimethylurea	Spike 20P, Spike 80 DF	20% (Spike 20P) 80% (Spike 80 DF)
Triclopyr	{(3,5,6-trichloro-2-pyridinyl)oxy}acetic acid	Clear Pasture, Pathfinder II, Triclopyr R&P Remedy Ultra, Triclopyr 4 EC	0.75 lbs./gal. (Pathfinder II) 4 lbs./gal. (all others)
Triclopyr:Fluroxypyr (3:1)	See triclopyr and 1-methylheptyl ester:((4-amino-3,5-dichloro-6-fluoropyridin-2-yl)oxy)acetic acid	PastureGard	2.0 lbs./gal.
Triclopyr:2,4-D(1:2)	See triclopyr and 2,4-D	Crossbow	3 lbs./gal.

\*Herbicides have been identified by the accepted Weed Science Society of America common name, and when practical, one or more product names.

\*\*Aquatic label

Items in gray boxes are recent changes approved by the Rangeland Herbicide Use Committee.

Page	Weed Controlled	Herbicide (common and chemical names – page 4)	Herbicide quantity (active ingredient rate in parenthesis)		Spray volume (per acre for broadcast, as described for individual plant)	Time to apply	Remarks	
			Broadcast rate per acre	Individual plant/spot treatment				
6	African rue	Velpar L		VH** 2 ml/plant	Use an exact delivery handgun to apply undiluted herbicide to soil surface at the edge of the plant canopy.	Spring or summer.	Do not use on heavy clay or caliche soils.	
		Pronone Power Pellets		1 pellet/plant				
		Spike 20 P	H 7.5 lbs (1.5 lbs.)					
		Arsenal	H 1 qt. (0.5 lbs.)	VH 0.5%	10 to 25 gal./ac. for ground broadcast. Thoroughly wet foliage for individual plant treatment. Add 1 to 2 qts. surfactant per 100 gal. water.	Late September through October (to first frost).	Applications should be made to fall regrowth that is in good growing conditions. Recommend using individual plant treatment when growing with desirable vegetation to reduce non-target damage. Arsenal is a non-selective herbicide and will kill or damage desirable vegetation if sprayed.	
6	Berlander lobelia, bitter sneezeweed, (annual or common), buffalobur, camphorweed, cocklebur, croton, horehound, marshelder (sumpweed or sulfaweed), plantain (tallowweed), prairie gerardia (see remarks), ragweed, smartweed, sunflower, thistles, Western bitterweed (see remarks), Western ragweed, wild carrot and others	2,4-D amine or low volatile ester	VH 1 pt. to 1 qt. (1/2 to 1 lb.) 4 lbs./gal. product	VH 1% (4 lbs./gal product)	2 to 4 gals. water for aerial spray; 10 to 25 gals. water for ground broadcast application. Thoroughly wet foliage for individual plant treatment. Add 1 to 2 qts. surfactant per 100 gals. of water.	Spring, weed 4 to 6 inches high, good moisture conditions. Spray thistles in rosette stage.	Use 2,4-D amine in areas with 25 inches of rainfall or more. Use 2,4-D low volatile ester in drier areas where no susceptible crops are nearby.  For Western bitterweed control use 2,4-D low volatile ester or amine at 1 qt/acre before plants flower and temperature (above 72 deg. F.) and soil moisture favors plant growth. When three fourths of plants are blooming and/or temperature is less than 60 deg. F., use Weedmaster, 2,4-D plus Banvel, Grazon P+D, GrazonNext or 2,4-D plus Tordon 22K  For prairie gerardia control, when plants are 4 to 6 inches high, use 1 1/2 qts./acre of 2,4-D or the low rates of Weedmaster, Banvel plus 2,4-D, Grazon P+D, or Tordon 22K + 2,4-D. When plants are 6 to 10 inches high, use the high rates, but spray before flowering.	
		Weedmaster	VH 1 pt. to 1 qt. (1/2 to 1 lb.)	VH 1%				
		Tank mix Banvel with 2,4-D amine or low volatile ester	VH 1/4 to 1/2 pt. (1/8 to 1/4 lb.) Banvel + 3/4 to 1 1/2 pts. (3/8 to 3/4 lb.) 2,4-D	VH 1/4% Banvel + 3/4% 2,4-D (4 lbs./gal. product)				
		Grazon P+D	VH 1 pt. to 1 1/2 qts. (0.3 to 0.9 lb.)	VH 1%				
		Tank mix Tordon 22K with 2,4-D or low volatile ester	VH 1/4 to 3/4 qts. (1/16 to 3/16 lb.) Tordon 22K + 1/2 to 1 1/2 pts. (1/4 to 3/4 lb.) 2,4-D	VH 1/4% Tordon 22K + 1/2% 2,4-D (4 lbs./gal. product)				
		Cimarron Max	VH** Rate 1 to Rate 2					
		Surmount	VH 1.5 pt to 1 qt. (0.25 to 0.33 lb.)	VH 1%				Use high end of rate range for camphorweed, marshelder and smartweed.
		PastureGard	H 1 to 1.5 qt. (0.5 to 0.75 lb.)	VH 1%				Use high end of rate range for camphorweed, marshelder and smartweed. PastureGard efficacy on smartweed is marginal.
		GrazonNext	VH 2 pts. (0.75 lb.)					
		Milestone	VH 4 ozs. (0.125 lb)					Milestone provides excellent control of thistles and annual weed species in general, although at this time efficacy of this herbicide is not confirmed for all of the species in this list.

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			Broadcast rate per acre	Individual plant/ spot treatment			
7	<b>Broomweed (annual or common), plantain (tallow weed), wild carrot</b>	Escort or Cimarron	VH 0.1 oz.		2 to 4 gals. water for aerial spray; 10 to 25 gals. water for ground broadcast application. Add 1 to 2 qts. surfactant per 100 gal. of water.	Spring, weeds less than 4 inches tall	
		Cimarron Plus	VH 0.125 oz.				
		Cimarron X-tra	VH 0.2 oz.				
8	<b>Broom snakeweed (perennial broomweed) (continued)</b>	Escort or Cimarron	VH 0.6 oz.		2 to 4 gals. water for aerial spray; 10 to 25 gals water for ground broadcast application. Add 1 to 2 qts. of surfactant per 100 gals. of water.	Optimum time is in the fall, but may be applied in the spring.	
		Cimarron Plus	VH 0.75 oz.				
		Cimarron X-tra	VH 1.2 oz.				
		Cimarron Max	H to VH Rate 1 to Rate 2				
		Spike 20P	VH 3.75 lbs. of pellets (3/4 lb.)	VH 1/6 oz. of pellets (1/30 oz.) per 100 sq. ft.			
10	<b>Lespedeza</b>	Remedy	VH 1 to 2 pts. (1/2 to 1 lb.)		Ground broadcast 20 to 20 gals. per acre with 1 to 2 qts. Of surfactant per 100 gals. of water.	June through August under good growing conditions.	Plants need to be 12 to 18 inches tall before spraying. Use the higher rate if plants are large, approaching maturity, or if the infestation level is high. Begin application at flower bud initiation through full bloom.
		Escort or Cimarron	H 0.5 oz.				
		Cimarron Plus	H 0.7 oz.				
		Cimarron X-tra	H 1.0 oz.				
		Cimarron Max	H Rate 2				
		Surmount	VH 1.5 to 2 pt. (0.25 to 0.33 lb.)	VH 1%			
		PastureGard	VH 1.5 to 2 pt. (0.38 to 0.5 lb.)	VH 0.75%			

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			Broadcast rate per acre	Individual plant/ spot treatment			
11	<b>Rayless goldenrod (jimmyweed)</b>	Escort or Cimarron	VH 0.75 oz		2 to 4 gals. water for aerial spray; 10 to 25 gals. water for ground broadcast application. Add 1 to 2 qts. surfactant per 100 gal of water.  Thoroughly wet foliage for individual plant treatment. Add 1 to 2 qts. surfactant per 100 gal. water.	Fall.	
		Cimarron Plus	VH 1.0 oz.				
		Cimarron X-tra	VH 1.5 oz.				
		Surmount	VH 6 pt. (1.0 lb.)	VH 2 %			
		Tordon 22K	VH 1 qt. (1/2 lb.)	VH 1%			
11	<b>Threadleaf Groundsel</b>	Escort or Cimarron	VH 0.4 oz.		2 to 4 gals. water for aerial spray; 10 to 25 gals water for ground broadcast application. Add 1 to 2 qts. surfactant per 100 gal of water.		
		Cimarron Plus	VH 0.5 oz.				
		Cimarron X-tra	VH 0.8 oz.				
		Cimarron Max	VH Rate 2				
12	<b>Upright Prairie- coneflower</b>	Escort or Cimarron	VH 0.2 oz.		2 to 4 gals. water for aerial spray; 10 to 25 gals water for ground broadcast application. Add 1 to 2 qts. surfactant per 100 gal of water.	Spring, before flower stalk development.	
		Cimarron Plus	VH 0.25 oz.				
		Cimarron X-tra	VH 0.4				
13	<b>Baccharis (dryland willow, Roosevelt willow, seep willow or willow baccharis)</b>	2,4-D low volatile ester	H 3 pts. To 3 qts. (1.5 to 3 lbs.) 4 lb./gal product	H 1%	4 to 5 gals. of water for aerial spray. 15 to 20 gals. water for ground broadcast. For individual plant treatment thoroughly wet the entire foliage, stems and trunks. Add 1 to 2 qts. surfactant per 100 gals. water.  For individual plant treatment thoroughly wet the entire foliage, stems and trunks. Add 1 to 2 qts. surfactant per 100 gals. water.	Spring, when leaves are fully expanded and dark green in color.	
		Grazon P+D		H 1%			
		Weedmaster		H 1%			
		Remedy		VH 1%			
		PastureGard		VH 1%			
		Surmount		VH 1%			

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# Woody Plants

Page	Weed Controlled	Herbicide (common and chemical names – page 4)	Herbicide quantity (active ingredient rate in parenthesis)		Spray volume (per acre for broadcast, as described for individual plant)	Time to apply	Remarks
			Broadcast rate per acre	Individual plant/spot treatment			
22	<b>Mesquite (suppression and weed control)</b>	2,4-D amine or low volatile ester	L 2 to 4 qts. (2 to 4 lbs.)	M 2% (4 lbs./gal. product)	<p>For aerial applications suggested total spray volume is 4 gal./acre. Use oil-in-water emulsion (1 to 5 oil to water ratio considered optimum), or water plus surfactant, crop oil or methylated seed oil.</p> <p>For ground broadcast applications the suggested total spray volume is 10 to 25 gal./acre. Use oil-in-water emulsion (1 to 5 oil to water ratio considered optimum), or water plus surfactant, crop oil or methylated seed oil.</p> <p>Thoroughly wet foliage for individual plant treatments. Add 1 to 2 qts. surfactant per 100 gals. of water or an oil-in-water emulsion (5% diesel + 95% water).</p>	<p>Late spring to mid-summer with mature leaves (dark green color). Optimum period of application begins when soil temperature at a depth of 12 inches reaches 75 deg. F and continues for 45 days.</p> <p>If treatment is applied prior to optimum soil temperatures, efficacy will be decreased and multiple applications over a period of years may be necessary to maintain less than 10% canopy.</p>	<p>Treatments will control many weeds. When using oil-in-water emulsion use emulsifier. Use of a treatment with a low control rating may result in multi-stem growth that may be more difficult to control in the future.</p>
		Grazon P+D	L 1 to 1.5 qts. (0.6 to 0.9 lbs.)				
		Weedmaster	L 1 to 1.5 qts. (1 to 1.5 lbs.)				
		Cimarron Max	L Rate 1 to Rate 2				
		Tordon 22K + 2,4-D amine or low volatile ester.	L 0.5 to 0.75 pt. (1/8 to 3/16 lb.) Tordon 22K + 1 to 1.5 qts. (1 to 1.5 lbs.) 2,4-D, 4 lbs./gal. product				
		Banvel + 2,4-D amine or low volatile ester.	L 0.5 to 0.75 pt. (1/4 to 3/8 lb.) Banvel + 3/4 to 1 1/8 qts. (3/4 to 1 1/8 lbs.) 2,4-D, 4 lbs./gal. product				
		Remedy	L 1 pt. to 1 qt. (0.5 lb. to 1 lb.)	M 1%			
		Banvel	L 1 pt. to 1 qt. (0.5 lb. to 1 lb.)	M 1%			

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Page	Weed Controlled	Herbicide (common and chemical names – page 4)	Herbicide quantity (active ingredient rate in parenthesis)		Spray volume (per acre for broadcast, as described for individual plant)	Time to apply	Remarks
			Broadcast rate per acre	Individual plant/ spot treatment			
23	Mesquite	Remedy		VH 2% in diesel fuel oil	<p>Apply to the base of the trunk from 12 to 18 inches above the soil surface. Apply until solution puddles on soil surface.</p> <p>For aerial applications suggested total spray volume is 4 gal./acre. Use oil-in-water emulsion (1 to 5 oil to water ratio considered optimum), or water plus surfactant, crop oil or methylated seed oil.</p> <p>For ground broadcast applications the suggested total spray volume is 10 to 25 gal./acre. Use oil-in-water emulsion (1 to 5 oil to water ratio considered optimum), or water plus surfactant, crop oil or methylated seed oil.</p> <p>Thoroughly wet foliage for individual plant treatments. Add 1 to 2 qts. surfactant per 100 gals. of water or an oil-in-water emulsion (5% diesel + 95% water).</p>	Anytime soil is dry and pulled away from the trunk.	
		Reclaim	M to H 1/3 qt. to 2/3 qt. (1/4 to 1/2 lb.)	VH 1%			
		Remedy + Tordon 22K	M 1/2 to 1 pt. (1/4 to 1/2 lb.) Remedy + 1 to 2 pts. (1/4 to 1/2 lb.) Tordon 22K	M to H 1/2% Remedy + 1/2% Tordon 22K			
		Remedy + Banvel	L 1/2 to 1 pt. (1/4 to 1/2 lb.) Remedy + 1/2 to 1 pt. (1/4 to 1/2 lb.) Banvel	M 1/2% Remedy + 1/2% Banvel			
		Remedy + Reclaim	M to H 1/4 to 1 pt. (1/8 to 1/2 lb.) Remedy + 1/3 to 2/3 pt. (1/8 to 1/4 lb.) Reclaim	VH 1/2% Remedy + 1/2% Reclaim			
		Tordon 22K + Banvel	M 1 to 2 pts. (1/4 to 1/2 lb.) Tordon 22K + 1/2 to 1 pt. (1/4 to 1/2 lb.) Banvel	H 1/2% Remedy + 1/2% Banvel			
		Tordon 22K + Reclaim	M to H 1 to 2 pts. (1/4 to 1/2 lb.) Tordon 22K + 1/3 to 2/3 qt. (1/4 to 1/2 lb.) Reclaim	VH 1/2% Tordon 22K + 1/2% Reclaim			

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26	Pricklypear, tasajillo	Tordon 22K	H 1 pt. to 1 qt. (1/4 lb. to ½ lb.)	VH 1%	For aerial applications suggested total spray volume is 2 to 4 gal./acre. Use oil-in-water emulsion (1 to 5 oil to water ratio considered optimum), or water plus surfactant, crop oil or methylated seed oil.	Anytime; best results have been obtained with late summer through fall applications.	Use emulsifier when adding diesel fuel oil to water. Use 1 pt./ac. Tordon 22K only on High Plains where no brush overstory is present. Late summer or fall applications, especially with Vista, will provide best results, but aerially spray in the winter or early spring if heavy overstory of woody plants is present or if damage to live oak is a concern.
		Surmount	H 4 pt. (0.67 lb.)	VH 1%			
		Grazon P+D	H 1 gal. (2.5 lbs.)	VH 2%			
		Vista		VH 1%	For ground broadcast applications the suggested total spray volume is 10 to 25 gal./acre. Use oil-in-water emulsion (1 to 5 oil to water ratio considered optimum), or water plus surfactant, crop oil or methylated seed oil.  Thoroughly wet plants for individual plant treatment adding 1 to 2 qts. surfactant per 100 gals. of spray mix.		
		Gramoxone Extra Tank mix Tordon 22K with Gramoxone Extra	These two treatments are deleted from B-1466.				
29	Saltcedar	Arsenal	VH 2 qts. (1 lb.)	VH 1%	Minimum 10 gals./acre for aerial or ground broadcast sprays. Thoroughly wet foliage for individual plant treatment. Add 1 to 2 qts. surfactant per 100 gals. water.	July through September or until leaves begin to turn yellow.	When exposure to aquatic environments is possible use aquatic labels of Arsenal and Roundup (see table "Common, Chemical and Product Names of Herbicides"). Arsenal alone or in combination with Roundup will cause damage to desirable plants if contacted by the spray mix.
		Arsenal + Roundup	VH 1 qt. (1/2 lb.) Arsenal + 1 pt. (1/2 lb.) Roundup	VH ½% Arsenal + ½% Roundup			
		Remedy		VH 25% in diesel fuel oil	Apply to lower 12 to 18 inches of trunk to wet the trunk; do not spray to point of runoff. Apply completely around the trunk.	Growing season when leaves have mature leaves.	This is commonly called the low volume basal application method. Use a hollow cone nozzle with X1 orifice.
		Tank mix Arsenal with Rodeo (glyphosate)	This recommendation is deleted, and moved to the remarks section.				

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			Broadcast rate per acre	Individual plant/ spot treatment				
30	Yucca	Remedy		H 2% in diesel fuel oil	Spray the center of each individual whorl of leaves to the point of runoff.	Anytime	Complete coverage of leaves is not necessary. The crown of each plant must be thoroughly wetted with the herbicide mixture.	
				H 2% in 1:5 diesel fuel oil:water emulsion		May through September.		Use emulsifier and agitate to maintain emulsion. Complete coverage of leaves is not necessary. The crown of each plant must be thoroughly wetted with the herbicide mixture.
				VH 15% in diesel fuel oil		Use an adjustable cone nozzle (X1 orifice) and spray a 2 second burst into each whorl.	Spring and summer.	
				H Undiluted 2 to 4 ml./plant whorl		Use an exact delivery handgun set at 2 or 4 ml. per whorl dose.		
		Pathfinder II	VH Undiluted	Use an adjustable cone nozzle (X1 orifice) and spray a 2-second burst into each whorl.				
		Cimarron Max + 2, 4-D low volatile ester	H Rate 2 Cimarron Max + 1 pt. to 1.5 pts. 2,4-D (4 lb a.i./gal. product).	Crop oil concentrate, modified seed oil or modified seed oil/organosilicone are the preferred adjuvants. For aerial applications a minimum of 4 gals./ac. total spray volume is recommended.	Spring through fall prior to frost.	A second follow-up application of Cimarron Max at Rate 1 or Rate 2 plus 2,4-D low volatile ester at 0.5 to 0.75 lbs. a.i./ac. within 2 years of the initial application may be required to control yucca seedlings and regrowth from rootstocks.		
		Cimarron Plus + 2,4-D low volatile ester	H 0.675 oz. Cimarron Plus + 1 qt 2,4-D (4 lb a.i./gal product)					
New	Burrobrush	Tordon 22K		VH 1%	Thoroughly wet foliage for individual plant treatment.	April through July.		
		Grazon P+D		VH 2%				

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